

The opinion in support of the decision being entered today was not written for publication and is not binding precedent of the Board.

UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES

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Ex parte KUEI-WU HUANG, TSIU C. CHAN, and GREGORY C. SMITH

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Appeal No. 2005-0773  
Application No. 09/517,987

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ON BRIEF

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Before THOMAS, BARRY, and LEVY, Administrative Patent Judges.  
THOMAS, Administrative Patent Judge.

DECISION ON APPEAL

Appellants have appealed the examiner's final rejection of claims 77 through 96.

Representative claim 77 is reproduced below:

77. An integrated circuit structure, comprising:

a substrate;

a field oxide over the substrate, the field oxide having an opening therethrough to a surface of the substrate;

a gate electrode over the surface of the substrate and within the opening, the gate electrode having insulating

material on a bottom and on two sides of the gate electrode, wherein the insulating material on the bottom of the gate electrode contacts the substrate; and

source and drain regions within the substrate and adjacent the insulating material on sides of the gate electrode, each source and drain region including

a first portion in the substrate, and

a second portion on the substrate over the first portion and adjacent to the insulating material on the sides of the gate electrode,

wherein the first and second portions together function as a source or drain for a device including the gate electrode.

The following references are relied on by the examiner:

Hsu	4,841,347	Jun. 20, 1989
Rodder et al. (Rodder)	5,079,180	Jan. 7, 1992
Doan et al. (Doan)	5,346,587	Sep. 13, 1994

Claims 77, 81 through 90 and 92 through 96 stand rejected under 35 U.S.C. § 102(b) as being anticipated by Hsu. Claims 78 through 80 stand rejected under 35 U.S.C. § 103. As evidence of obviousness, the examiner relies upon Hsu in view of Doan. As to claim 91, the examiner rejects this claim under 35 U.S.C. § 103 as being obvious over Hsu in view of Rodder.<sup>1</sup>

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<sup>1</sup>As expressed at the bottom of pages 2 and 5 of the answer, the examiner has withdrawn an outstanding rejection of all claims on appeal under 35 U.S.C. § 103 in view of Pierce and Doan.

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Rather than repeat the positions of the appellants and the examiner, reference is made to the brief and reply brief for appellants' positions and to the answer for the examiner's positions.

#### OPINION

As expanded upon here by us, we sustain the rejections of the noted claims under 35 U.S.C. § 102 and 35 U.S.C. § 103.

Appellants present arguments as to independent claims 77, 93 and 96 as well as dependent claims 87 and 90 in the context of the first stated rejection under 35 U.S.C. § 102 over Hsu. No arguments are presented in the brief and reply brief as to any remaining rejection of the claims on appeal under 35 U.S.C. § 103.

At the outset, we note that independent claim 77, in pertinent part, recites a first portion of a source and drain region in the substrate as well as a second portion on the substrate that is further recited to be over the first portion as well as adjacent to the insulating material on the sides of the gate electrode. Claim 77 concludes with the wherein clause stating "the first and second portions together function as a source or drain for a device including the gate electrode." Substantially identical structural elements are set forth in

independent claims 93 and 96 as were just recited with respect to independent claim 77, with the additional recitation that the recited regions of the source and drain within the substrate are "at least lightly doped." The corresponding regions on the substrate are merely recited to be "suitable for heavily doped source and drain regions."<sup>2</sup> Claims 93 and 96 conclude with corresponding wherein clauses as in independent claim 77.

At pages 9 and 10 of the principal brief on appeal, appellants' principal arguments are that Hsu is silent as to the heavily doped epitaxial regions 50 in figures 4, 5, 9 and 10 of Hsu functioning together with the shallow source/drain regions 24 and 26 as source and drain regions of the respective transistor shown. Appellants further assert that Hsu does not refer to the heavily doped epitaxial regions 50 as source or drain regions or portions thereof. Appellants' arguments continue by asserting that Hsu indicates that heavily doped

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<sup>2</sup>The prosecution history in this application presumes that the recitation of "suitable for" is a positive recitation where in our view it clearly is not. A mere suitability for heavily doped source and drain regions does not positively recite that the regions are heavily doped and it does not positively recite that the regions are source and drain regions as well. These observations, however, do not affect our decision.

epitaxial regions 50 are merely conductive connections to the source regions and drain regions 24 and 26 from the refractory metal silicide contact region 54 in figures 5 and 10.

The examiner's responsive arguments at pages 5 and 6 of the answer take the view that Hsu teaches the same structure as appellants have disclosed, citing figure 5a and region 40 shown in appellants' specification drawings. The examiner's view concludes that because the epitaxial regions 50 of Hsu and the source/drain regions 24 and 26 in the substrate are in electrical contact with each other, they must necessarily function together as source and drain regions.

In affirming the rejection of the claims on appeal, we do not agree with any of arguments presented by appellants in the brief and reply brief because the summary of the invention, taken as a whole, clearly indicates the position of the examiner is correct. For example, topic (b) at column 1, lines 53 through 54 states:

(b) forming the source and drain regions adjacent the side walls of the gate so that the regions extend downwardly from the surface to a depth of less than 100 nm.

Appellants' consideration of the specific teachings at columns 2 and 3 of Hsu presents an incomplete consideration of the teachings of this reference.

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To the extent dependent claims 87 and 90 are argued by appellants at page 13 of the principal brief on appeal, the figures in Hsu show that the respective source and drain regions 24 and 26 in the substrate have a doping level of N, whereas the upward, extended regions of the source and drain regions adjacent to the gate electrode are represented by N<sup>+</sup>, thus indicating respective light dopings and comparatively heavier doping levels.

In view of the foregoing, the decision of the examiner rejecting various claims on appeal under 35 U.S.C. § 102 and 35 U.S.C. § 103 is affirmed.

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No time period for taking any subsequent action in  
connection with this appeal may be extended under 37 CFR  
§ 1.136(a).

AFFIRMED

JAMES D. THOMAS	)	
Administrative Patent Judge	)	
	)	
	)	
	)	BOARD OF PATENT
LANCE LEONARD BARRY	)	APPEALS AND
Administrative Patent Judge	)	INTERFERENCES
	)	
	)	
STUART S. LEVY	)	
Administrative Patent Judge	)	

JDT:hh

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